REMARKS

As basis for rejection of claims 1, 3, 5, 7, 8, 11, 12, 14, 15, 19 and 20, the Examiner points to a combination of Mansfield ('920) in view of Hass ('141). Applicant suggests that a focus upon the "shield" is the central issue. The shield, in the disclosure of Mansfield is a pair of radially spaced current carrying conductors, the function of which is to produce a magnetic field in the region radially exterior to the shield disposed around the sensitive volume that will cancel the field in that external region due to the Maxwell pair coils in the interior of that sensitive volume. The function of nulling the field in the exterior region is also the function to be met by the present invention through significantly different structure. One gross distinction of the present invention with Mansfield is that the shield structures of the present invention are "shield coils of equal radius and axially spaced" (emphasis added).

The Examiner has correctly sought a prior art structure to combine with Mansfield, e.g., a pair of axially spaced shield coils, in place of Mansfield's radially spaced shields. The Hass reference fails because the axially spaced shields there disclosed are RF shields, not the magnetic field coils forming nulling structures for which the word "shields" has been employed.

Nowhere does Hass suggest that his RF shield is other than a conventional RF shield, e.g., a conducting sheet or equivalent unipotential surface possessing a thickness greater than the RF skin depth. As such these RF shields are unrelated to the claimed coils capable of supporting "currents of equal magnitude and opposite sense and selected axial dependence" (claim 1).

Applicant acknowledges that the final paragraph of the Haas reference specification describes Figure 17 with a reference to

> "The coil section 58A comprises a section 62 of shield coils, a section 64 of generating coils, and a section 66 of shield." (col. 8, lines 65-67).

Three sentences later, there occurs a further reference:

> "In the coil section 56 the shield coil section 62 and the generating coil 64 each contain three coils .....of main magnetic field". (col. 9, lines 8-13)

The matter of the structural form mentioned (coil) does not cure the problem that nowhere in this prior art is there any discussion of a "shield" other than an RF shield. Even if the Examiner prefers to consider Hass' fleeting reference to a "coil" structure as significant, it is clear that there is no basis for assuming that the very different axial spaced geometry of Hass'

(RF) shields is incorporable in Mansfield's arrangement that requires radially spaced coils. Again, there is no prescription in Hass for providing an axial current distribution in any such coil/shield to support cancellation of a gradient magnetic field along the z axis.

Claim 1 includes an express limitation requiring that the currents in each of the shield coil pair is equal in magnitude and opposite in sense, with a selected axial dependence for these currents. An amendment is here offered to correct the wording that is clearly meant to refer to the axial current density, that is, the current per axial unit length. The basis for this correction is asserted to be transparent to the reader, but, for the record, attention is drawn to figure 5 and to page 3, lines 21-24, and p.5, lines 21-24 where the non-uniform character of axial winding spacing is remarked, etc. In like manner similar amendment is proposed for claim 11.

Additional amendment is offered to improve the clarity of the claim.

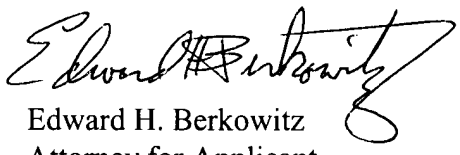
It is further observed that claim 11 specifies that "said equal currents" that energize the gradient coils also serves to energize the shield coils.

Claim 20 is amended to remove reference to an "RF" gradient field. No RF gradient is discussed anywhere within the application. RF excitation is not the topic of the invention, nor does the gradient field vary in any manner other than conventional for the purposes of the field of the invention. Claim 20 is further amended to clearly refer to the steps of the method by reference to the steps themselves.

Claim 7 is amended to correct an erroneous dependence.

Applicant has shown the distinction of the invention over prior art of record and suggests that the present rejection based upon the combination of Mansfield with Haas be withdrawn and the amended claims be allowed. Applicant asserts that no new matter has been introduced by these amendments.

Respectfully submitted,



Dated: October 31, 2003

Edward H. Berkowitz
Attorney for Applicant
Registration No. 27,771

Varian, Inc.
3120 Hansen Way, D-102
Palo Alto, CA 94304
(650) 424-5403